Stem cells treat macular degeneration
19 March 2018, by Julie Cohen

The results of this groundbreaking clinical study, published in *Nature Biotechnology*, describe the safe and effective implantation of a specially engineered patch of retinal pigment epithelium cells derived from stem cells to treat people with sudden severe sight loss from wet AMD—the form that afflicted Waters. This is the first description of a completely engineered tissue that has been successfully used in this way.

"This study represents real progress in regenerative medicine and opens the door on new treatment options for people with age-related macular degeneration," said co-author Peter Coffey, a professor at UCSB's Neuroscience Research Institute and co-director of the campus's Center for Stem Cell Biology & Engineering.

Macular degeneration accounts for almost 50 percent of all visual impairment in the developed world and usually affects people over 50 years of age. AMD affects the central (reading) vision while leaving the surrounding vision normal. Wet AMD is generally caused by abnormal blood vessels that leak fluid or blood into the region of the macula in the center of the retina and almost always begins as dry AMD. Researchers hope the new procedure will also help in the future to treat dry AMD.

In July 2015, 86-year-old Douglas Waters developed severe age-related macular degeneration (AMD). He struggled to see things clearly, even when up close.

A few months later, he became part of a clinical trial that used stem cell-derived ocular cells developed in part by researchers at UC Santa Barbara. His retinal eyepatch was implanted at Moorfields Eye Hospital, a National Health Service (NHS) facility in Waters' hometown of London, England.

In the months before Waters' surgery, his vision was poor and he couldn't see anything out of his right eye. After the surgery, his eyesight improved so much that he could read the newspaper and help his wife with gardening.

"We hope this will lead to an affordable 'off-the-
shelf therapy that could be made available to NHS patients within the next five years," said Coffey, who founded the London Project to Cure Blindness more than a decade ago.